

7. HOST PREFERENCE AND REPORT OF TWO NEW HOST PLANTS
OF *LORANTHUS LONGIFLORUS* AT INDORE, MADHYA PRADESH, INDIA

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Introduction

Species of the Mistletoe family characteristically show parasitism. *Loranthus* is recorded from Sumatra, New Guinea, Ceylon (now Sri Lanka), Pakistan (Abdulla 1973), India, Thailand, Australia, China, Bangladesh, Malaysia, Myanmar (Pattanayak *et al.* 2008) and United Provinces (India) (Srivastava 1935). *Loranthus longiflorus* is distributed throughout India (Chopra 1975). A large number of host plants of *L. longiflorus* are reported by various scientists (Srivastava 1935; Sampathkumar and Kunchithapatham 1969; Narayanasamy and Sampathkumar 1981; Sampathkumar and Selvaraj 1981; Balsubramanian and Sugathan 1986; Sawant *et al.* 2008).

Study Area and Method

Indore is situated at 22° 48' N and 75° 48' E, 553 m above mean sea level. The campus of Government Holkar Science College (an area of about 36 acres) and its adjoining area and Vasudeonagar (an area about 5 acres), Indore, Madhya Pradesh, were selected to survey the host range of *Loranthus longiflorus*. 762 flowering plants of 60 species were screened between January 15 and April 15, 2009. This is a common species in the urban area of Indore.

Results and Discussion

Loranthus longiflorus Desr. flourished on 7 out of 43 species in the study area. Two host plants: *Albizia lebeck*

Table 1: Host range relationship of *Loranthus longiflorus* in the campus and adjoining area of Government Holkar Science College, Indore, M.P.

S. No.	Plant Studied	Family	Total no. of studied	Total no. of infected	S. No.	Plant Studied	Family	Total no. of studied	Total no. of infected
1.	<i>Aegle marmelos</i>	Rutaceae	2	0	23.	<i>Pithecellobium dulce</i>	Mimosaceae	47	1
2.	<i>Acacia nilotica</i>	Mimosaceae	57	0	24.	<i>Pterospermum acerifolium</i>	Sterculiaceae	1	0
3.	<i>Albizia lebeck</i>	Mimosaceae	16	10	25.	<i>Phoenix sylvestris</i>	Palmae	13	0
4.	<i>Annona squamosa</i>	Annonaceae	4	0	26.	<i>Mitragyna parviflora</i>	Rubiaceae	4	0
5.	<i>Azadirachta indica</i>	Meliaceae	60	5	27.	<i>Santalum album</i>	Santalaceae	68	0
6.	<i>Artocarpus heterophyllus</i>	Moraceae	1	0	28.	<i>Polyalthia longifolia</i>	Annonaceae	20	0
7.	<i>Butea monosperma</i>	Papilionaceae	1	0	29.	<i>Tamarindus indica</i>	Caesalpinaceae	23	0
8.	<i>Ceiba pentandra</i>	Bombacaceae	9	0	30.	<i>Ziziphus mauritiana</i>	Rhamnaceae	10	0
9.	<i>Caesalpinia pulcherrima</i>	Caesalpinaceae	8	0	31.	<i>Kigella pinnata</i>	Bignoniaceae	1	0
10.	<i>Cordia myxa</i>	Boraginaceae	16	2	32.	<i>Dalbergia sissoo</i>	Papilionaceae	2	0
11.	<i>Cassia fistula</i>	Caesalpinaceae	11	0	33.	<i>Maduca longifolia</i>	Sapotaceae	2	0
12.	<i>Delonix regia</i>	Caesalpinaceae	13	0	34.	<i>Pongamia pinnata</i>	Papilionaceae	12	0
13.	<i>Embliba officinalis</i>	Euphorbiaceae	9	0	35.	<i>Tectona grandis</i>	Verbenaceae	1	0
14.	<i>Eucalyptus camaldulensis</i>	Myrtaceae	46	1	36.	<i>Bombax malabaricum</i>	Bombacaceae	7	0
15.	<i>Syzygium cumini</i>	Myrtaceae	41	0	37.	<i>Bauhinia variegata</i>	Caesalpinaceae	1	0
16.	<i>Ficus benghalensis</i>	Moraceae	3	0	38.	<i>Grevillea robusta</i>	Proteaceae	9	0
17.	<i>Ficus racemosa</i>	Moraceae	7	0	39.	<i>Millingtonia hortensis</i>	Bignoniaceae	3	0
18.	<i>Ficus religiosa</i>	Moraceae	18	1	40.	<i>Acacia leucophloea</i>	Mimosaceae	1	0
19.	<i>Leucaena leucocephala</i>	Mimosaceae	29	0	41.	<i>Morinda tinctoria</i>	Rubiaceae	3	0
20.	<i>Mangifera indica</i>	Anacardiaceae	40	15	42.	<i>Cassia siamea</i>	Caesalpinaceae	7	0
21.	<i>Mimusops elengi</i>	Sapotaceae	6	0	43.	<i>Ixora parviflora</i>	Rubiaceae	3	0
22.	<i>Peltophorum acerifolium</i>	Caesalpinaceae	46	0					

(62.5%) and *Mangifera indica* (37.5%) seem to be most susceptible (Table 1). However, in Vasudeonagar colony 10 out of 29 species were affected. Here, *Mangifera indica* (58.33%) and *Grevillea robusta* (44.44%) were the preferred hosts of *Loranthus*. Two new hosts, i.e., *Pseuderanthemum atropurpureum* (Acanthaceae) and *Lagerstroemia indica* (Lythraceae) (Table 2), were observed during this study. Occurrence of *Loranthus* on these shrubs, grown as ornamentals, proves that it has tremendous adaptability for hosts. *L. longiflorus* generally prefers big trees with well-developed lenticels on bark, but in this case the condition did not appear to be applicable. Infection of *Loranthus* on these shrubs appeared to be by chance. Another important feature recorded during the study was that *L. longiflorus* does not grow on monocots, probably as monocots have scattered vascular bundles and penetration of *Loranthus* roots in the xylem of the host may be difficult.

Pseuderanthemum atropurpureum is nearly 3.65 m tall having several (38 to 40) thick and thin branches arising from the stem at ground level. *Loranthus* had attacked a 0.9 cm diameter branch. Interestingly, the apical portion of this branch was dead after infection. This plant was c. 12.19 m away from three infected plants. Another host *Lagerstroemia indica*, was c. 3.05 m tall, c. 6.09 m from two infected plants. More than 300 species of host plants of *Loranthus longiflorus* have been reported in literature (Srivastava 1935; Suryaprakash *et al.* 1967; Sampathkumar and Kunchithapatham 1969; Narayanasamy and Sampathkumar 1981; Sampathkumar and Selvaraj 1981; Indrani and Balasubramanian 1985; Balasubramanian and Sugathan 1986; Ramchandranair and Krishanakumar 1989; Pattanayak *et al.* 2008; Sawant *et al.* 2008), but none have reported these two hosts. Therefore, these two species are new reports for India. In our view, this parasite is not host specific; infection success depends on favourable conditions at the time the seed falls on the host. Narayanasamy and Sampathkumar (1981) report higher osmotic pressure of semi-parasite than hosts for infection success.

Loranthus longiflorus is one of the most important traditional medicinal species. Its medicinal properties are greatly influenced by the host plant (Jain 1997; Pattanayak *et al.* 2008), therefore, further study is required for evaluation of *Loranthus longiflorus* on the new reports.

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Table 2: Host range relationship of *Loranthus longiflorus* in Vasudeonagar, Indore, M.P.

S. No.	Plant Studied	Family	Total no. of studied	Total no. of infected plants
1.	<i>Cassia fistula</i>	Caesalpinaceae	3	1
2.	<i>Lagerstroemia indica</i>	Lythraceae	2	1
3.	<i>Plumeria alba</i>	Apocynaceae	3	0
4.	<i>Peltophorum acerifolium</i>	Caesalpinaceae	3	0
5.	<i>Pongamia pinnata</i>	Papiilionaceae	2	0
6.	<i>Azadirachta indica</i>	Meliaceae	3	1
7.	<i>Delonix regia</i>	Caesalpinaceae	1	0
8.	<i>Millingtonia hortensis</i>	Bignoniaceae	3	0
9.	<i>Grevillea robusta</i>	Proteaceae	9	4
10.	<i>Moringa oleifera</i>	Moringaceae	2	0
11.	<i>Psidium guajava</i>	Myrtaceae	7	2
12.	<i>Mangifera indica</i>	Anacardiaceae	12	7
13.	<i>Ficus religiosa</i>	Moraceae	1	0
14.	<i>Annona reticulata</i>	Annonaceae	1	1
15.	<i>Michelia champaca</i>	Magnoliaceae	1	0
16.	<i>Bambusa sp.</i>	Bombacaceae	1	0
17.	<i>Cocos nucifera</i>	Palmae	2	0
18.	<i>Gardenia jasminoides</i>	Rubiaceae	1	0
19.	<i>Cassia renigera</i>	Caesalpinaceae	1	0
20.	<i>Cordia myxa</i>	Boraginaceae	1	0
21.	<i>Hibiscus rosa-sinensis</i>	Malvaceae	2	0
22.	<i>Ficus racemosa</i>	Moraceae	1	1
23.	<i>Terminalia catappa</i>	Combretaceae	2	0
24.	<i>Bauhinia variegata</i>	Caesalpinaceae	1	0
25.	<i>Callistemon lanceolatus</i>	Myrtaceae	1	1
26.	<i>Alstonia scholaris</i>	Apocynaceae	11	0
27.	<i>Melia azadirachta</i>	Meliaceae	2	0
28.	<i>Pseuderanthemum atropurpureum</i>	Acanthaceae	1	1
29.	<i>Thevetia nerifolia</i>	Apocynaceae	1	0

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8. *SELAGINELLA RETICULATA* (HOOK. & GREV.) SPRING (SELAGINELLACEAE) –
A NEW RECORD TO THE PTERIDOPHYTIC FLORA OF RAJASTHAN,
NORTH-WESTERN INDIA

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Rajasthan in north-west India is the largest state with an area of 3,42,274 sq. km and lies between 23° 3'-30° 12' N and 69° 30'-78° 17' E. Aravalli ranges, which are one of the oldest mountain ranges of the world, diagonally divide the state into two distinct climatic regions. The region towards the north-western side of Aravalli is a desert or semi-desert characterized by sand dunes, high wind velocity, high temperature and thorny vegetation. The region towards the south-eastern side is a humid zone with hills of variable heights, ravines, plains, rivers and dense forests.

Sitamata Wildlife Sanctuary (Fig. 1) is one of the protected areas of Rajasthan with a wide range of habitats in the Aravalli ranges. It is exceptional for diversity and interspersed habitats, which includes areas of teak stands, perennial streams, sloping hills and fine groves of mixed woodlands. The Sanctuary lies on the Udaipur-Pratapgarh state highway at a distance of 100 km from Udaipur and 40 km from Pratapgarh. The major part of the Sanctuary lies in the newly formed civil district of Pratapgarh, only 74.21 sq. km comes under district Chittorgarh. The Sanctuary covers an area of 422.95 sq. km (195.09 sq. km core area and 227.86 sq. km buffer area) and lies between 24° 04'-24° 23' N and 74° 25'-74° 40' E. The occurrence of flying squirrel is the greatest attraction of the Sanctuary.

Geographically, there are three major operating systems, namely the Aravalli, the Vindhyan and Malva plateau, which result in a variety of habitats. The annual rainfall in the Sanctuary area ranges from 664.60 mm to

1,430.20 mm with an average 30 rainy days. The temperature varies from 18.6-33.6 °C.

Selaginella Beauv. with 700 species (Pichi-Sermolli 1977) is represented by 62 species in India (Alston 1945; Panigrahi and Dixit 1966, 1967, 1968; Dixit 1984, 1992). The first enumeration of the Indian species of *Selaginella* was provided by Alston (1945). Subsequently, Panigrahi and Dixit (1966, 1967, 1968) carried out prolonged research on this genus and dealt with 30 species of *Selaginella* in detail. Sharma and Bhardwaja (1976) have reported the occurrence of *Selaginella repanda* (Desv.) Spring for the first time from Gwaparnath, Kota (south-east Rajasthan). A new species of *Selaginella*, namely *Selaginella rajasthanensis* was described by Gena *et al.* (1979) from Kunda Khoh, Shahabad, Baran district of Rajasthan. Recently, Dulawat and Chaudhary (2008) have recorded *Selaginella ciliaris* (Retz.) Spring from Sitamata, Rajasthan. The present paper deals with the detailed taxonomic account, distribution and ecological notes of *Selaginella reticulata* recorded from Sitamata forest in Rajasthan.

An extensive survey of the area of Sitamata Wildlife Sanctuary was carried out during 2004-2009. Various localities which seem likely to support the growth of *Selaginella* were visited regularly, especially during rainy season (July-October). Field observations, such as habit, habitat, associated plants were recorded. Identification was done using Alston (1945), Panigrahi and Dixit (1966), and Dixit (1984, 1992). Morphological observations and camera